

CLAIMS

1. A method for sensing selected emotions in a human subject, comprising the steps of:

generating an image of substantially all of the face of a human subject;

processing the image to identify movements in selected critical areas of the face;

comparing the identified movements in the selected critical areas with a database that associates movements in selected critical areas with specific emotional and physical conditions; and

generating a report of the emotional and physical condition of the subject.

2. A method as defined in claim 1, wherein the processing step comprises:

inputting a two-dimensional frame of the image;

scanning the image to locate the subject's face and determine its relative position and extent;

scanning the facial part of the image to detect the selected critical areas;

repeating the preceding steps for a sequence of image frames;

recording frame-to-frame changes in critical areas of interest; and

recording frame-to-frame changes in critical area positions, for purposes of tracking the positions while permitting limited movement of the subject.

3. A method as defined in claim 2, wherein the step of recording frame-to-frame changes in critical areas of interest includes recording changes in spot area.

4. A method as defined in claim 2, wherein the step of recording frame-to-frame changes in critical areas of interest includes recording changes in axial distance, to facilitate detection of axial pulsing movements.

5. A method as defined in claim 1, wherein the comparing step makes use of a database that uses the facial action coding system (FACS).

6. Apparatus for sensing selected emotions in a human subject, the apparatus comprising:

- an optical imaging device, for generating an image of substantially all of the face of a human subject;

- an image processing module, for processing the image to identify movements in selected critical areas of the face;

- a database that associates groups of facial movements with specific emotional and physical conditions of the subject;

- a database analysis module, for comparing the identified movements in the selected critical areas with the database; and

- a report generator, for generating a report of the emotional and physical condition of the subject.

7. Apparatus as defined in claim 6, wherein the optical imaging device comprises a charged-coupled device (CCD) camera producing a two-dimensional image.

8. Apparatus as defined in claim 6, wherein the image processing modules comprises:

means for inputting a two-dimensional frame of the image;

means for scanning the image to locate the subject's face and determine it's relative position and extent;

means for scanning the facial part of the image to detect the critical areas of interest;

means for repeating the preceding steps for a sequence of image frames;

means for recording frame-to-frame changes in the critical areas of interest; and

means for recording frame-to-frame changes in critical area positions, for purposes of tracking the positions while permitting limited movement of the subject.

9. Apparatus as defined in claim 8, wherein the means for recording frame-to-frame changes in the critical areas includes means for recording changes in area.

10. Apparatus as defined in claim 8, wherein:

the optical imaging device includes means for measuring axial distance to a critical area of the face; and

the means for recording frame-to-frame changes in critical area positions includes means for recording changes in axial distance, to facilitate detection of axial pulsing movements in a critical area.

11. Apparatus as defined in claim 8, wherein the database uses the facial action coding system (FACS).